

Type A Accident
Investigation Report
of the
June 25, 1997
Contract Inspector Fatality
on the
Satsop-Aberdeen #2 & #3
230 kV Line

B O N N E V I L L E
POWER ADMINISTRATION



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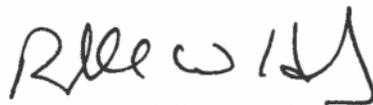
On June 27, 1997, I established a Type-A Accident Investigation Board to investigate the June 25, 1997 fatal contractor accident which occurred on BPA's Satsop-Aberdeen #2 and #3 230-kV transmission lines right-of-way. The responsibilities of this board have been completed with respect to this investigation. The analysis, identification of root causes, contributing causes and judgement of need reached during the investigation were performed in accordance with DOE Order 225.1, Accident Investigations.

As stated in BPA's memorandum to Tara O'Toole, Assistant Secretary, Environment, Safety and Health, dated August 5, 1997, we do not view these accidents as coincidental. Our analysis have shown commonalities linked to each occurrence. As a result of our investigations we are proceeding to implement a single corrective action plan designed to address the judgement of needs for this accident and the April 25, 1997 and July 25, 1997 accidents. Management will be implementing its corrective action plan by mid October.

We are fully committed to implementing this plan and strengthening current BPA practices that will enhance our ability to reduce contractor accidents on our system. BPA's verification process for selecting contractors will be expanded to include safety performance. BPA will improve its processes for review of experience and training to assure that contractors are qualified to perform all aspects of the contracted work. Future service and construction contract language will clearly state BPA's expectations for compliance with established safe work practices.

Inspection and verification, by BPA inspectors, of contractors work will be upgraded by increasing the qualifications of our inspectors and contracting officers representatives. Management support and direction to the individuals that oversee contract work will be clear and direct leaving no doubt as to the critical nature and importance for the safety of the work force.

I accept the findings of the board and authorize the release of this report for general distribution.

A handwritten signature in black ink, appearing to read "Randall W. Hardy". The signature is written in a cursive, somewhat stylized font.

Randall W. Hardy
Administrator and Chief Executive Officer

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EXECUTIVE SUMMARY

INTRODUCTION

On June 25, 1997, at approximately 1015 hours, a contract brush-cutting inspector/monitor was fatally injured in a tree-falling accident within a BPA transmission-line corridor.

On June 27, 1997, Randall W. Hardy, Administrator and Chief Executive Officer for Bonneville Power Administration, appointed a Type A Accident Investigation Board (AIB) to investigate the accident in accordance with DOE Order 225.1, *Accident Investigation*, and BPA Manual Chapter 181, *Accident Investigation and Reporting*.

ACCIDENT DESCRIPTION

The accident occurred at approximately 1015 hours on Wednesday, June 25, 1997, when a contract inspector, employed by Cinebar Services, Inc., of Cinebar, Washington, attempted to cross an area previously worked by the brush-cutting contractor. The scene of the accident was on the right-of-way containing the Satsop-Aberdeen #2 and #3 230-kV transmission lines and was located approximately 218 feet southwest of structure 8/4 (fourth structure in the eighth mile) out of BPA's Satsop Substation on the Satsop-Aberdeen #3 230-kV line. The tree faller was employed as a contract hand brush cutter for CORRUCO of Chehalis, Washington. The contract in place was for hand brush cutting and vegetation services on the right-of-way of the Satsop-Aberdeen #2 and #3 230-kV transmission lines. Work began on June 16, 1997, and was to be completed on or before September 30, 1997. The job was being completed on schedule.

At the time of the accident, the work assignment was vegetation control and brush cutting (including trees) between structures 8/4 on the Satsop-Aberdeen #3 230-kV line and 8/5 on the Satsop-Aberdeen #2 230-kV line and the Chehalis River. The transmission-line corridor for this area is 237 feet wide and 337 feet long. On June 25, at the job site, six CORRUCO employees and their foreman met briefly with the contract inspector just prior to 0800 hours. The inspector told the foreman what needed to be done — clearing brush and vegetation, including trees — within the assigned work area. The foreman then assigned his employees their tasks, with work beginning at approximately 0800 hours. For the next two hours, they cut the required brush and trees, within the transmission-line corridor, from the two structures south to the river.

At approximately 1000 hours, the inspector and foreman met at the base of a 126-foot cottonwood tree to discuss the crew's progress. Two more employees were standing nearby. Concurrently, approximately 75 feet east of the cottonwood, four CORRUCO employees were removing limbs from a tree that had been cut and had fallen into the river. The foreman and the inspector discussed cutting the cottonwood and several other trees adjacent to structure 8/4. The inspector informed the foreman that he was leaving the work area and heading for his truck, parked outside the cutting area. The foreman told one of the brush cutters to cut the trees by structure 8/4. The inspector and brush cutter set out together, eastward, away from the cottonwood tree, with the brush cutter slightly ahead. The brush cutter continued eastward, then turned north, parallel to the east corridor tree line. The inspector also turned; however, he headed north-northwest, toward his truck and toward the path leading into the cutting area. The probable course would have taken him through the previously cut, but not cleared, brush and trees in direct line of the cottonwood tree to be fallen.

During the time the inspector was crossing into the work area, estimated and reported in statements to be 15 to 20 minutes, the foreman started to cut the cottonwood tree. The foreman made his initial face cut, then stopped and looked around to make sure no one was in the fall area. Even though downed trees and brush prevented him from seeing all of the fall area, he proceeded to make his back cut. Upon completing this final cut, the foreman shut off his saw and yelled “TIMBER” in English and “TREE FALLING” in Spanish. Then the CORRUCO employee adjacent to structure 8/4 yelled “Inspector in the area, I can’t see him.” The foreman immediately jumped up on either the cottonwood tree butt or tree stump and called out for the inspector several times. He stated that he heard the inspector respond “Here! Here!” The foreman proceeded down the fallen tree about 65 feet. Approximately 30 feet away, he saw the inspector among the tree branches and limbs. He rushed to the inspector, saw that he was injured and unresponsive, and then called for help from the other CORRUCO employees. The foreman instructed one employee to stay with the inspector (this individual stated that he did not apply first aid or talk to the inspector) and told the others to enlarge the path into the work area so medical personnel could enter. He ran to his pickup and called 911 on his cellular phone, but was unable to fully describe the exact location. He then drove to the nearest farm house, 3/4 mile away, where a resident of the farmhouse called 911 and provided the actual location and address of the farmhouse.

The first medical response was from the Montesano Fire Department, which provided initial medical assistance. Subsequently, Montesano personnel called Airlift Northwest, in Seattle, to transfer the injured inspector to Harbor View Medical Center in Seattle. The inspector was admitted by Harbor View Medical Center emergency room personnel to their trauma unit, where life support was provided. With family concurrence, medical life support was removed and the inspector expired June 25, 1997, at 2228 hours, in the Harbor View Medical Center, Seattle, Washington.

ROOT & CONTRIBUTING CAUSES

The Board identified four Root Causes for this event. These Root Causes, if eliminated, might have prevented the accident:

1. Failure of CORRUCO to properly train workers associated with brush cutting, especially on tree-falling requirements.
2. Failure of CORRUCO to assure that only properly trained and experienced employees were allowed to fall large trees.
3. Failure of the work site supervisor/faller to assure that the area where the cottonwood tree was to fall was clear of all personnel.
4. Failure of safety measures — the inspector was not aware of, or ignored, proper tree-falling methods.

In addition, four Contributing Causes were identified:

1. CORRUCO management had responsibility and was accountable for worker safety. However, there is no evidence of workers and/or supervisors being properly trained to perform assigned tasks in a safe manner.
2. CORRUCO’s work planning, organizing and execution were inadequate, as were provisions for adequate safe work procedures, ability to follow a safe work plan, and assurance that existing safe work procedures were implemented or adhered to.
3. CORRUCO and Cinebar failed to adequately ensure effective communication between the inspector and the foreman, who were speaking and understanding two different languages (English & Spanish).
4. CORRUCO failed to adequately communicate work assignments to all members of the crew. The inspector told the foreman what work to accomplish and the foreman instructed CORRUCO employees on their work assignments.

RESULTS OF INVESTIGATION

After an on-site investigation and review of statements by CORRUCO employees, the accident investigation revealed that there were no training records for work experience, only one individual held a current First Aid/CPR card and the crew's experience in falling large trees was less than adequate, as evidenced by inspection of the work site. Established Federal and State rules for tree cutting were not followed. Communication barriers between Spanish-speaking workers and the English-speaking inspector inhibited two-way communication of the work-planning process. Contract specification language needs to differentiate between tree falling and brush cutting. More definitive language is also needed to clarify safety requirements such as training records, First Aid/CPR qualifications and work-site communication.

ADDITIONAL INVESTIGATIVE REPORTS

The Board will review the accident investigative report from Washington State's Department of Labor and Industries (WISHA) to obtain any additional information discovered from their investigation, including any previous contractor citations and/or documentation of unsafe working practices or procedures, for brush cutting, vegetation control and tree falling. The completion date for the WISHA report depends on the report's acceptance by the Washington State Attorney General. Also, before the final report can be published, all citations must be issued and a settlement reached by all interested parties. Thus, the issuance date of the final report is unknown.

CONCLUSIONS

- The contractor must utilize experienced, qualified tree fallers with knowledge of relevant brush control/tree-falling requirements on site at all times.
- Adequate communication must be assured when two different languages are spoken at a work site: the presence of people proficient in both languages must be required.
- All employees must be adequately notified of and able to describe the exact work location and directions to the site for any and all emergency responses.
- Contractor employees at work locations must be certified to, and be capable of performing according to, all Federal and state First Aid/CPR requirements.
- BPA contract language needs clarification and strengthening regarding safety responsibility, qualifications, rules enforcement and work stoppage, and the differences between tree/brush cutting and construction.
- Appropriate regulatory agencies, including the BPA Safety Office, need to be promptly notified about project commencement, location and scope of work.

JUDGEMENT OF NEEDS SUMMARY

The conclusions determined by the AIB Board clearly show that contractors employ verifiably qualified and experienced brush cutters and tree fallers. There must be someone on site who can assure that speakers of different languages are truly communicating the same information. Someone certifiably capable of providing first aid/CPR must be present on site at all times. Finally, once BPA contractual language is strengthened to reflect the Board's conclusions, prework meeting(s) must be held to thoroughly clarify these issues for service contractors.

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TYPE A
ACCIDENT INVESTIGATION REPORT
OF THE JUNE 25, 1997
CONTRACT INSPECTOR FATALITY
ON THE
SATSOP-ABERDEEN #2 & #3 230-KILOVOLT (KV) LINE

This is a report by the Accident Investigation Board (AIB) formed to investigate the fatal tree-falling accident suffered by an employee of Cinebar Services Inc., Cinebar, Washington, and also involving employees of CORRUCO, Chehalis, Washington, both under contract to the Bonneville Power Administration (BPA).

1.0 INTRODUCTION

1.1 Background

On June 25, 1997, at approximately 1015 hours, a contract brush-cutting inspector/monitor for Cinebar Services, Inc., was fatally injured in a tree-falling accident within a BPA transmission-line corridor, involving a Corruco-employed tree faller.

On June 27, 1997, Randall W. Hardy, Administrator and Chief Executive Officer for the Bonneville Power Administration, appointed a Type A Accident Investigation Board to investigate the accident in accordance with DOE Order 225.1, Accident Investigation, and BPA Manual Chapter 181, Accident Investigation and Reporting.

1.2 Site Description

The accident site is located on the Satsop-Aberdeen #2 and #3 230-kilovolt (kV) line right-of-way (ROW), about 200 feet southeast of structure 8/5 (fifth structure in the eighth mile) on the Satsop-Aberdeen #2 and 218 feet southwest of structure 8/4 (fourth structure in the eighth mile) on the Satsop-Aberdeen #3 out of BPA's Satsop Substation, located south of Montesano, Washington. The ROW is located on BPA-owned property. Back-on-line (BOL) approximately 337 feet is the Chehalis River (See Exhibit 1 and Fig. 1). The corridor width is 237 feet. These dimensions encompass the overall area of the work location and accident site. The contract work in progress was part of an overall project that included significant brush cutting, vegetation control and tree falling within the ROW along the entire length of the two transmission lines (See Exhibit 2).

At the time of the accident, seven CORRUCO employees were performing the following work at the accident site: Three brush cutters were working on removing limbs and brush from a tree that had been cut and had fallen into the river; the foreman and two additional employees were approximately 75 feet west at the base of a 126-foot cottonwood tree; and another employee was located adjacent to structure 8/4, approximately 100 feet northeast of the accident site.

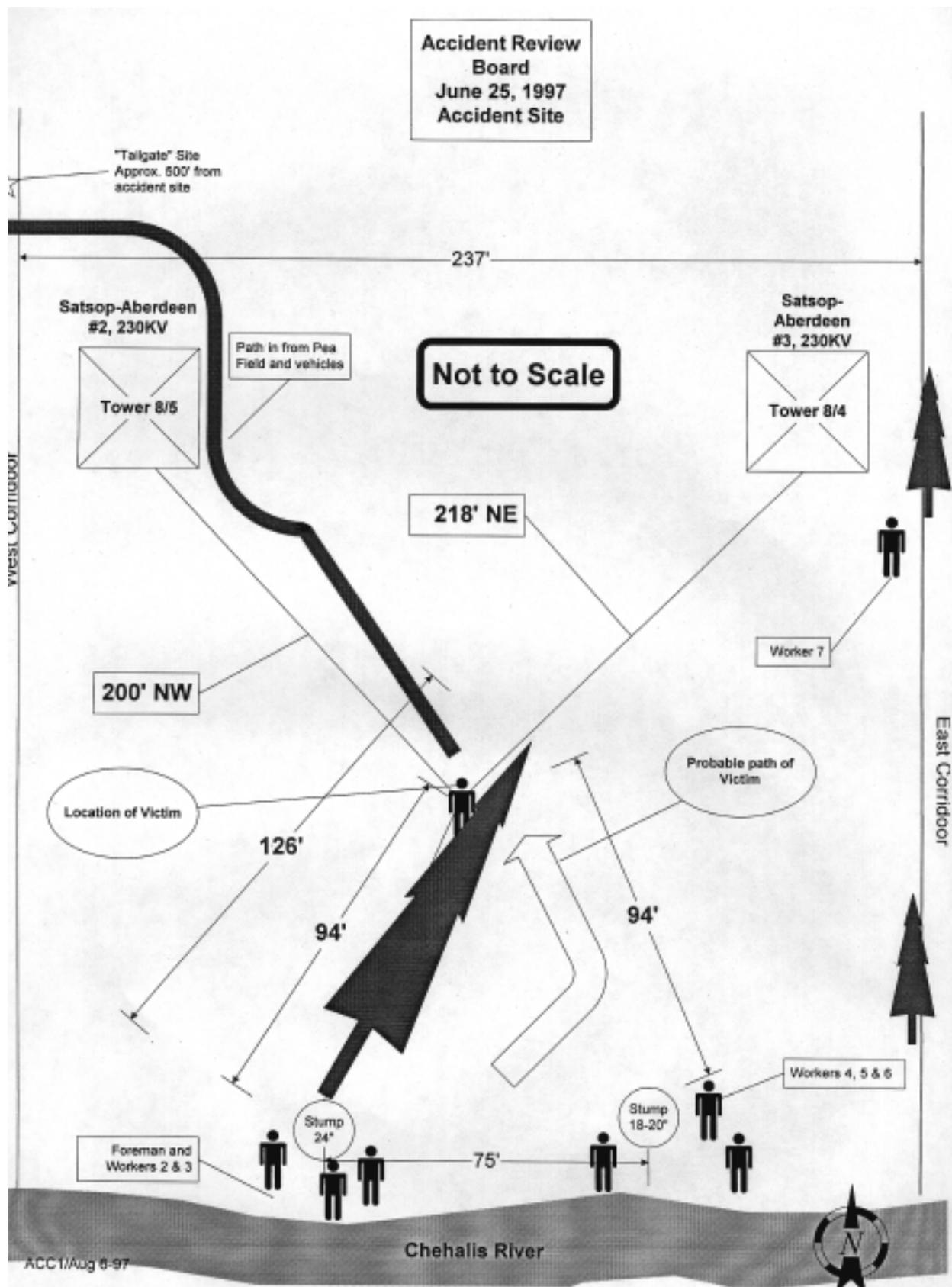


Figure 1 - Sketch of Accident Site



Exhibit 1 - View Back on Line



Exhibit 2 - Right-of-Way Corridor

1.3 Scope, Conduct and Methodology

The initial accident investigation commenced on June 25, 1997, with the investigation team headed by BPA Safety Office DOE-trained accident investigators. This investigation continued until June 27, 1997, when Randall W. Hardy, Administrator and Chief Executive Officer, Bonneville Power Administration, upon approval of the US Department of Energy (DOE), appointed a Type A Accident Investigation Board to investigate the accident in accordance with DOE Order 225.1, Accident Investigations, and BPA Manual Chapter 181, Accident Investigations and Reporting. The Board commenced its investigation on July 1, 1997, completed the investigation on August 8, 1997, and submitted its findings to the BPA Administrator and Chief Executive Officer on September 11, 1997.

The scope of the Board's investigation was to review and analyze the circumstances to determine the accident's cause(s). The Board also considered the adequacy of both the contractor's safety management systems and work control practices. Additionally, the Board reviewed and analyzed present BPA contractual language, examining the role of BPA's construction contractor personnel safety standards, as well as other utilities' contractual language and standards for safety and health procedures.

The investigation was to determine if there were any deficiencies in contractor safety management systems, contract employee training and qualifications, or in the interpretation of contractor-acceptable safe working practices that might have caused the accident, and to examine BPA's on-site role in contract compliance issues.

The Board conducted its investigation using the following methodology:

- Gathering facts relevant to the accident through interviews, documentation and physical evidence reviews.
- Reviewing BPA contractual practices and language.
- Reviewing contractual practices and language of several public, governmental and private agencies or utilities.
- Reviewing CORRUCO's planning, organizational and work procedures.
- Using additional report analysis (i.e., OSHA and/or WISHA Reports) to provided supportive correlation and identification of the accident's causes.

Based on analysis of the data, judgments of need for corrective actions to prevent recurrence will be developed from this report.

2.0 FACTS AND ANALYSIS

2.1 Background and Accident Description

The accident occurred at approximately 1015 hours on Wednesday, June 25, 1997, as a contract brush-cutting inspector/monitor employed by Cinebar Services, Inc., Cinebar, Washington, attempted to cross through a previously cut — but not designated to be cleared — area. The contract for hand brush cutting and vegetation services on the right-of-way under the Satsop-Aberdeen #2 and #3 230-kV transmission lines began June 16, 1997, and was to be completed on or before September 30, 1997. The scene of the accident was between structure 8/5 (fifth structure in the eighth mile) of the Satsop-Aberdeen #2 and 8/4

(fourth structure in the eighth mile) of the Satsop-Aberdeen #3 230-kV transmission lines and the Chehalis River.

A “tailgate” instructional meeting, attended by all CORRUCO employees and the Cinnebar inspector, was conducted on the morning of June 25, 1997, before the accident and prior to work commencing (See Exhibit 3). The results of the statement process and meetings with each individual CORRUCO employee revealed that the foreman spoke only Spanish and broken English; the remaining CORRUCO employees spoke Spanish only. Acting in his role as overseer of work to be accomplished and of quality assurance, the inspector told the CORRUCO foreman what needed to be done: clearing brush and trees within the right-of-way (ROW) work area. The foreman then translated for the brush-cutting crew, informing them of their assigned tasks. Specific details of the actual discussion are not available.

The work in progress was being completed on time. No apparent urgency or rush to complete work was discovered.

At approximately 0800 hours, after the “tailgate” instructional meeting, the brush-cutting crew from CORRUCO began cutting brush at the entrance into the transmission-line corridor. The inspector,



Exhibit 3 - Tailgate Site

through the foreman, told the crew to stop work because they were in the wrong place. He said that the required brush cutting would actually be between the two structures — 8/5 and 8/4 — and the Chehalis River. (See Exhibit 4) The crew then made a pathway into the work area (See Exhibits 5-7) and started cutting brush and trees in the corridor, proceeding from the two structures, BOL,0 south towards the river.

At approximately 1000 hours, the inspector and foreman met to discuss the cutting progress and what still needed to be done. One 126-foot cottonwood tree, next to the river and several trees and brush adjacent to structure 8/4 still required cutting, and a tree that had been cut and had fallen into the river still needed to be removed. At this time, the foreman, the inspector and two employees stood adjacent to the large cottonwood tree slated for cutting. Four other employees stood approximately 75 feet east. The inspector told the foreman that he was leaving the cutting area and heading for his truck, parked where they had initially entered the work area. Concurrently, the foreman instructed one of the brush cutters to go cut the



Exhibit 4 - Work Area



Exhibits 5-7 - Path into the Work Area



Exhibit 6



Exhibit 7

previously overlooked trees and brush by structure 8/4. Subsequently, the inspector and the brush cutter walked together, with the brush cutter slightly ahead of the inspector. Both proceeded eastward, away from the cottonwood tree. Then the inspector turned and headed north-northwest, toward his truck and the path leading into the work zone, through the previously cut brush and trees. This was in the path of the cottonwood tree to be fallen (See Exhibits 8-10). The brush cutter turned north, parallel with the east corridor tree line, to the area that needed cutting adjacent to structure 8/4.



Exhibits 8, 9 & 10 - The Inspector's Probable Path Toward the Fall Line of the Tree.

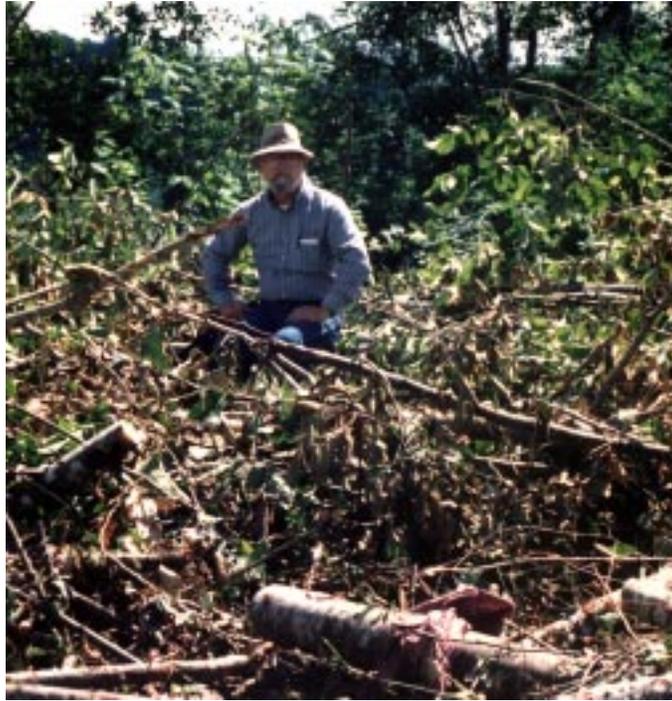


Exhibit 9



Exhibit 10

Statements indicated that, 15 to 20 minutes after the foreman and inspector had spoken, the foreman started to cut the cottonwood tree. The time elapsed coincides with a reconstruction, by two investigators, of the inspector's movement along the path from the work area, leaving the site where the foreman and the inspector had met and traversing the probable path to the accident location. The extreme density of the uncleared, cut brush and trees contributed significantly to this seemingly prolonged interlude. The foreman made his initial face cut, and, according to his statement, stopped and looked over the fall area to make sure no one was there. The presence of thick brush and previously downed trees prevented the foreman from seeing all of the fall area. Nevertheless, he promptly proceeded to make his back cut. Upon completing this final cut, the foreman shut off his saw and yelled "TIMBER," in English, and "TREE FALLING" in Spanish. Concurrently, the CORRUCO employee adjacent to structure 8/4 called out "Inspector in the area, I can't see him." (See Exhibit 11.) After the tree had fallen, the foreman immediately jumped up on either the cottonwood tree butt or tree stump (he isn't sure) and called out to the inspector several times (See Exhibit 12). According to the foreman's statement, the inspector responded "Here! Here!" Hearing this response, the foreman proceeded approximately 65 feet down the fallen tree and saw the inspector, about 30 feet away, among the tree branches and limbs (See Exhibit 13).



Exhibit 11 - Location of Employee Adjacent to Structure 8/4



Exhibit 12 - Foreman's View of the Accident Site



Exhibit 13 - Accident Spot

The foreman rushed to the inspector, saw that he was injured, and yelled for the other CORRUCO employees to come and help. According to statements taken, they all observed that blood was coming from the inspector's nose, mouth, and left ear. The foreman was the only First-Aid/CPR-trained employee, but he administered no emergency treatment. He told the employee who had been working next to structure 8/4 to stay with the inspector, and instructed the other employees to start enlarging the pathway into the work area so medical personnel could reach the accident site. On site CORRUCO employees provided no medical attention (First-Aid/CPR) to the injured inspector. Since the foreman was the only English-speaking crew member, he ran to his pickup and called 911 on his cellular phone but was unable to describe the exact location. He then drove his pickup 3/4 mile to the nearest farmhouse, where the resident called 911 and provided the actual location and address of the farmhouse (See Exhibit 14). The first medical attention was provided by the responding medical personnel approximately 30 minutes after the accident occurred.

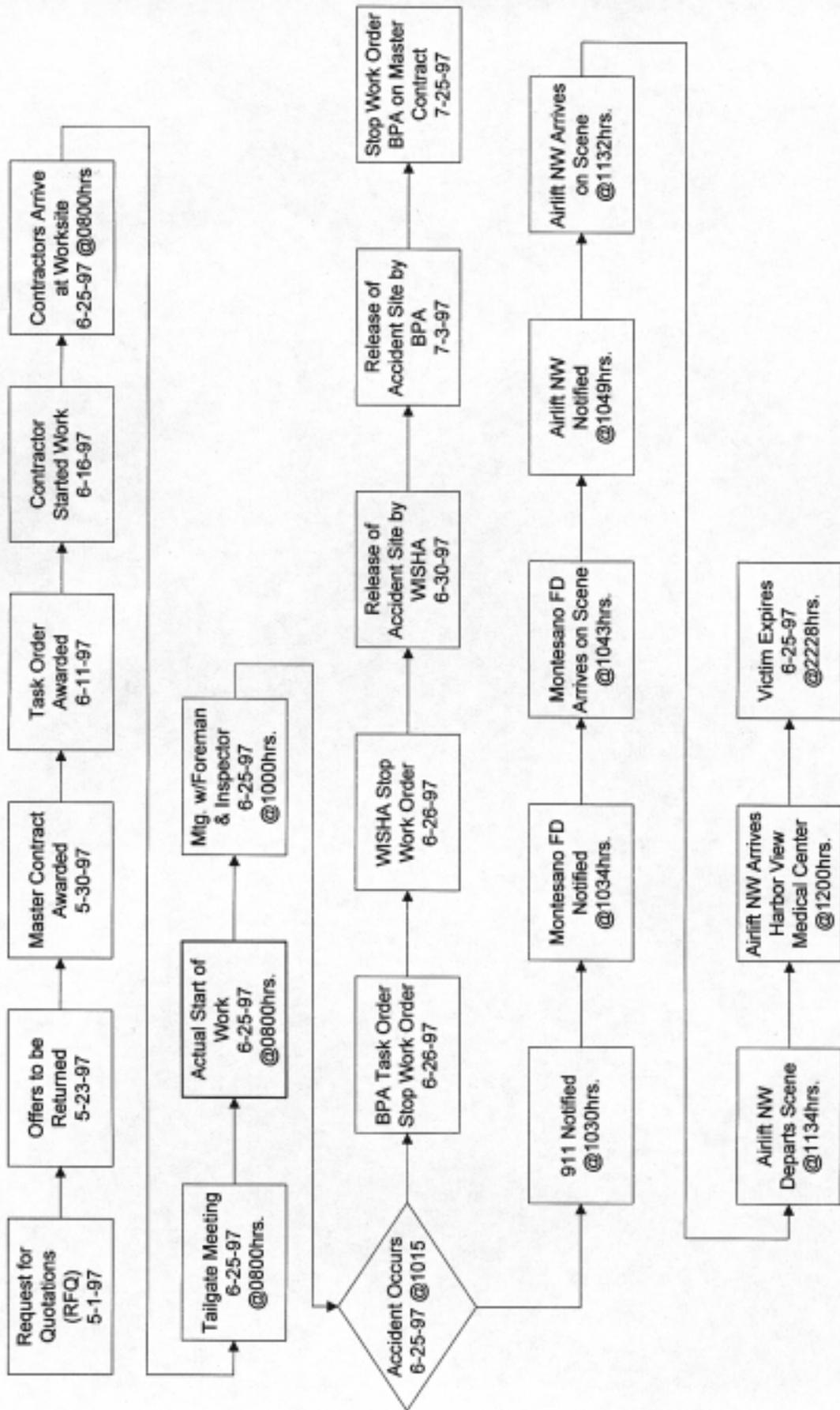


Exhibit 14 - Aerial View of Farmhouse Where 911 Call was Made.

2.1.1 Chronology of Events

The graphic summary of events below (Figure 2) shows the accident in the context of the overall service contract:

Figure 2 - Summary of Events



2.1.2 Emergency Response and Investigative Readiness

Though the CORRUCO foreman called 911 immediately from the cellular phone in his pickup, he was unable to describe the exact location. He proceeded to the closest farmhouse, 3/4 mile away. There, a resident of the farmhouse contacted 911, Grays Harbor Communications dispatch center, with the exact location, address of the farmhouse and the information that a possible tree-falling injury had occurred. The Montesano Fire Department was dispatched at 1034 hours and arrived at the accident scene at 1043 hours. Emergency medical attention was provided by personnel from the Montesano Fire Department. They notified Airlift Northwest at 1049 hours that an airlift was needed. Airlift Northwest arrived from Seattle at 1132 hours and departed for Harbor View Medical Center in Seattle at 1134 hours. They arrived at Harbor View Medical Center at 1200 hours. The injured inspector was evaluated by Harbor View Medical Center emergency room personnel. Following evaluation, he was moved to the trauma unit and immediately placed on life support. After hearing the findings, conclusions, and recommendations of hospital and medical support personnel, his family decided to terminate life support at approximately 2225 hours. The inspector expired at 2228 hours on June 25, 1997, at the Harbor View Medical Center, Seattle, Washington.

An autopsy was performed by the King County Medical Examiner. The examiner's findings were reviewed by BPA's Occupational/Medical Consultant. The autopsy report identifies the cause of death as a blunt-force injury of head, left side. Since this was an industrial accident, no law enforcement investigation was required. A toxicology test was conducted only on the victim.

2.1.3 Significant Tree-Falling Procedures

The following is a summary of the standard, significant tree-falling procedures as outlined in applicable Federal and State regulations and tree-falling/logging-industry standards. (OSHA, WISHA, and D. Douglas Dent, "*Professional Timber Falling - A Procedural Approach*," 1974.)

- The Lay: Once the faller decides where the tree should fall, he should walk around his intended lay to look for unseen objects or personnel in the fall area (See Exhibit 15).
- After the initial face cut is made, the faller should shut off his saw and make a final, visual observation of the fall area (See Exhibits 16-22 for improper tree-falling examples). He should obtain full assurance from vocal responses that no employees are in the work/fall area; employees should respond to the faller with their exact location. The faller should know how many employees are involved and compare that figure to the number of responses he receives.
- No adjacent work areas or personnel shall be closer than two tree lengths of the tree being fallen.
- When anyone announces that he is leaving the cutting area, no further tree falling should be permitted until the faller is provided assurance that the individual is actually out of the area.



Exhibit 15 - The Lay of the Falling Tree



Exhibits 16-22 - Improper Cutting Methods



Exhibit 17



Exhibit 18



Exhibit 19



Exhibit 20



Exhibit 21



Exhibit 22

2.1.4 Applicable Federal and State Regulations

Relevant sections of the Occupational Safety and Health Administration, contractually agreed to by BPA, CORRUCO and Cinebar are referenced below:

OSHA Subpart “K” - Medical and First Aid

1910.151 Medical Services and First Aid

(b) Adequately trained to render first aid and first aid supplies requirement.

OSHA Subpart “R” - Special Industries

1910.266 Logging Operations

(d) General Requirements

(d)(1) Personal Protective Equipment

(d)(2) First Aid Kit

(d)(6) Work Areas

(d)(7) Signaling and Signal Equipment

(e) Hand Held Portable Powered Tools

(e)(2) Chain Saws

(h) Tree Harvesting

(h)(1) General Requirements

(h)(2) Manual Felling

(i) Training

(k) Appendices

Appendix A. First Aid Kits (Mandatory)

Appendix B First Aid and CPR Training (Mandatory)

The following section applies exclusively to the inspector, from Cinebar:

- 1910.269 Electric Power Generation, Transmission, and Distribution
 - (a)(2) Training
 - (c) Job Briefing
 - (c)(1) Number of Briefings
 - (c)(2) Extent of Briefing
 - (r) line-clearance tree-trimming operations
 - (x) Definitions
- See - Line Clearance - Tree Trimmer

2.1.5 Washington State Department of Labor and Industries: Safety Standards for Logging Operations

WAC 296-54-513, Safety Education, Training, and First-Aid Requirements

- (7) First-Aid Training.
 - (a) The employer shall assure that each employee, including supervisors, receives or has received first-aid and CPR training.
 - (b) First-aid and CPR training shall comply with the requirements of this section and WAC 296-24-060 (3)(e), Part A-1.
 - (c) The employer shall assure that each employee's first-aid and CPR training and/or certificate of training remain current.
- (10) Certification of Training.
 - (a) The employer shall verify compliance with subsection (1) of this section by preparing a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer.
 - (b) The most recent training certification shall be maintained.

WAC 296-54-515, General Requirements.

- (15) Work Areas.
 - (a) Employees shall be spaced and the duties of each employee shall be organized so the actions of one employee will not create a hazard for any other employee.
 - (b) Work areas shall be assigned so that trees cannot fall into an adjacent occupied work area. The distance between adjacent occupied work areas shall be at least two tree lengths of the trees being felled. The distance between adjacent occupied work areas shall reflect the degree of slope, the density of the growth, the height of the trees, the soil structure and other hazards reasonably anticipated at that work site. A distance of greater than two tree lengths shall be maintained between adjacent occupied work areas on any slope where rolling or sliding of trees or logs is reasonably foreseeable.
- (16) Signaling and Signal Equipment.

Engine noise, such as from a chain saw, is not an acceptable means of signaling. Signaling and signal equipment shall comply with the requirements of this chapter.

WAC 296-54-529, Falling and Bucking - General.

- (2) No employee shall approach a faller closer than two tree lengths of trees being felled until the faller has acknowledged that it is safe to do so, unless the employer demonstrates that a team of employees is necessary to manually fell a particular tree.
- (3) Before falling or bucking any tree:
 - (a) A sufficient work area shall be swamped;
 - (b) The faller shall plan and clear a retreat path; and
 - (i) The retreat path shall extend diagonally away from the expected felling line unless the employer demonstrates that such a retreat path poses a greater hazard than an alternate retreat path; and
 - (ii) An escape path shall be used as soon as the tree or snag is committed to the fall, roll, or slide.
- (4) Warning to be given:

Fallers shall give timely and adequate warning prior to falling each tree; such warning shall be given with the saw motor at idle or shut off. Persons in the area shall give response to the faller and shall also notify faller(s) when they are in the clear.
- (19) All fallers and buckers shall have a current first-aid card.
- (20) All fallers and buckers shall carry or have with them in near proximity at all times, an ax, a minimum of two wedges, a whistle and a first-aid kit. The whistle shall be carried on their person.

These WISHA standards address mandatory timber-falling and logging requirements that govern the contractor’s work. The regulations specifically address required safe working procedures and tree-falling methods that were not adhered to by Cinebar or CORRUCO employees.

2.2 TYPICAL CONTRACT PRACTICES

The following summary table contains data covering several public, governmental and private agencies or utilities that were compared to determine typical industry oversight processes on contractors performing similar work.

Table 1		
Utility	Oversight	Contractor Responsibility
Public/Governmental		
Washington Water Power (WWP)	Oversight is provided by foresters who have been safety trained. Ungrounded clearances are utilized and issued to the contractor. if minimum safe working distances are in question, a	Contractors must meet OSHA & WISHA requirements; contractor employees must demonstrate an experienced level of safety and arbors knowledge. WWP utilizes two canned training programs - one produced by the National Arbor

	qualified WWP employee will ascertain the clearance and the ground	Association & another by ACRT, on electrical hazards. A similar program is utilized by Pennsylvania Electric.
Bonneville Power Administration (BPA)	Oversight (hands-off policy) to recommend compliance through inspector or COTR. Contractor cannot take hold orders or clearances.	Contractor is responsible for assuring safe work practices & compliance with applicable OSHA & state regulations.
Western Area Power Administration (WAPA)	Some oversight to recommend compliance and correction through Inspector and Safety Manager. Contractor cannot take hold orders or clearances.	Contractor is responsible for safety and assurance of knowledgeable or competent workmen.
US Forest Service (USFS)	Some oversight to recommend compliance and correction through Contracting Officer or designated individual.	Contractor is responsible for safety and compliance with OSHA and state requirements.
British Columbia Hydropower (BC Hydro)	Oversight not provided on a continuous basis. Prejob conference is held where safety hazards and regulations are reviewed. Sight checks are made & safety check-off sheets are used. Hold orders are issued to contractors, but clearances & grounding are accomplished by BC Hydro employees.	Contractors must provide employees with a level of training and certification required by their Workers Compensation Board (OSHA).

Private

Pudget Sound Energy (PSE)	Little or no oversight. PSE holds preliminary & quarterly meetings where safety rules, regulations & hazards are reviewed. They use contract inspectors to perform right-of-way inspections. Contractors take clearances & hold orders. Grounding is accomplished by PSE personnel.	Contractors are required to submit an annual work plan that includes safety training & certification goals. Contractor personnel are required to be line-clearance certified by the Union. The contract makes clear separation in safety responsibilities & stipulates the contractor must meet OSHA/WISHA standards.
Idaho Power (IP)	Idaho Power provides no direct supervision. If hold orders or clearances are required, they are held by IP personnel. They do daily checks for contract compliance.	Bonding & insurance are required. Contractor is responsible for training of personnel. They are required to follow OSHA standards. Contractors hold their own "tailgate" meetings & are required to review hazards, regulations, & practices.

Oklahoma Gas & Electric (OG&E)	OG&E does not provide direct oversight or supervision. They do not police contractor conformance to OSHA or any other safety regulations. Inspection is performed by an OG&E employee & is limited to contract compliance. However, any observations of infractions to safety rules are reported to the contractor.	Contractors are totally responsible for any & all safety requirements.
--------------------------------	---	--

BPA’s oversight is comparable to that of other NW utilities and the US Forest Service. Washington Water Power exacts greater contractor certification requirements than BPA and other NW utilities.

BPA uses the Bonneville Purchasing Instructions (BPI), Clause 15-2, “Safety and Health,” and Clause 15-4, “Safety, Health, and Property Protection - Services,” as their procedures and guidelines. Additional information is provided in the following Federal Acquisition Regulations (FAR) requirements used by other Federal agencies. Other Federal agencies have adopted the FAR clauses for use within their own agencies or have developed additional clauses (e.g., NASA).

Federal Acquisition Regulations (FAR):

The contracting officer shall insert clause 52.236-13, “Accident Prevention,” in solicitations and contracts when a fixed-price construction contract or a fixed price dismantling, demolition, or removal of improvements contract is contemplated and the contract amount is expected to exceed the small purchase limitation.

(ACCIDENT PREVENTION - NOV. 1991)

- (a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.
- (b) For these purposes, on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall—
 - (1) Provide appropriate safety barricades, signs, and signal lights;
 - (2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and
 - (3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for this purpose are taken.
- (c) If this contract is for construction, dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of US Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.
- (d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent damage to the health or safety of the public or Govern-

ment personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

(ALTERNATE 1 - Nov. 1991)

If the contract will involve (a) work of a long duration or hazardous nature, or (b) performance on a Government facility that on the advice of technical representatives involves hazardous materials or operations that might endanger the safety of the public and/or Government personnel or property, add the following paragraph (f) to the basic clause:

(f) Before commencing the work, the Contractor shall—

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

NASA SAFETY CLAUSE (FAR-BASED):

(Safety and Health - March 1997)

(a) The Contractor shall take all reasonable safety and health measures in performing under this contract. The Contractor shall comply with all Federal, State, and Local laws applicable to safety and health in effect on the date of this contract and with the safety and health standards, specifications, reporting requirements, and provisions set forth in the contract Schedule.

(b) The Contractor shall take or cause to be taken any other safety and health measures the Contracting Officer may reasonable direct. To the extent that the Contractor may be entitled to an equitable adjustment for those measures under the terms and conditions of this contract, the equitable adjustment shall be determined pursuant to the procedures of the changes clause of this contract; provided that no adjustment shall be made under this safety and health clause for any change for which an equitable adjustment is expressly provided under any other provision of the contract.

(c) The Contractor shall immediately notify and promptly report to the Contracting Officer or a designee any accident, incident, or exposure resulting in fatality, lost-time occupational injury, occupational disease, contamination of property beyond any stated acceptable limits set forth in the contract Schedule, or property loss of \$25,000 or more arising out of work performed under this contract. The Contractor is not required to include in any report an expression of opinion as to the fault or negligence of any employee. Service contractors (excluding construction contracts) shall provide quarterly reports specifying lost-time frequency rate, number of lost time injuries, exposure, and accident/incident dollar loses as specified in the contract Schedule. The Contractor shall investigate all work-related incidents or accidents to the extent necessary to determine their causes and furnish the Contracting Officer a report, in such form as the Contracting Officer may require, of the investigative findings and proposed or completed corrective actions.

(d) (1) The Contracting Officer may notify the Contractor in writing of any noncompliance with this clause and specify corrective actions to be taken. The Contractor shall promptly take and report any

necessary corrective action.

(2) If the Contractor fails or refuses to institute prompt corrective action in accordance with subparagraph (d)(1) of this clause, the Contracting Officer may invoke the stop-work order clause in this contract or any other remedy available to the Government in the event of such failure or refusal.

(e) The Contractor (or subcontractor or supplier) shall insert the substance of this clause, including this paragraph (e) and any applicable Schedule provisions with appropriate changes of designations of the parties, in subcontracts of every tier that (1) amount to \$1,000,000 or more (unless the Contracting Officer makes a written determination that this is not required), (2) require construction, repair, or alteration in excess of \$25,000, or (3) regardless of dollar amount, involve the use of hazardous materials or operations.

(f) Authorized Government representatives of the Contracting Officer shall have access to and the right to examine the sites or areas where work under this contract is being performed in order to determine the adequacy of the Contractor's safety and health measures under this clause.

(g) As a part of the Contractor's safety plan (and health plan, where applicable) and to the extent required by the Schedule, the Contractor shall furnish a list of all hazardous operations to be performed, including operations indicated in paragraphs (a) and (b) of this clause, and a list of other major or key operations required or planned in the performance of the contract, even though not deemed hazardous by the Contractor. NASA and the Contractor shall jointly decide which operations are to be considered hazardous, with NASA as the final authority. Before hazardous operations commence, the Contractor shall submit for NASA concurrence either or both of the following, as required by the contract Schedule or by the Contracting Officer:

- (1) Written hazardous operating procedures for all hazardous operations.
- (2) Qualification Standards for personnel involved in hazardous operations.

SUMMARY

Typical oversight practices of various utilities and agencies involved in brush clearing, tree falling or tree thinning are similar to that of BPA: Providing minimal oversight of the Contractor's safety program or practices; placing the responsibility and training solely on the Contractor; and making the Contractor responsible for meeting all Federal, state, and local laws and requirements. The Contractor is responsible for developing adequate training, recognizing work hazards and hiring qualified employees.

2.3 BPA'S CONTRACTOR PERSONNEL SAFETY & ENVIRONMENT

2.3.1 BPA's Service Contract Historical Policy

Historically, BPA has placed responsibility for personnel safety and environmental protection on service contractors. Generally, safety and environmental protection under this policy were good. BPA Contracting Officer's Technical Representatives (COTRs) and Field Inspectors primarily monitored contractor results for compliance with contract requirements. COTRs and field inspectors were expected to halt seriously unsafe contractor operations if observed. The contractor's judgment generally prevailed in matters where no serious, immediate hazard was present. Historically, BPA has not emphasized safety as a criterion in contract award selection.

2.3.2 BPA's Service Contract Current Policy

BPA's current policy, both via management direction and contracting operational procedures, is to place the responsibility for ensuring the safety of contractor personnel, property, and the environment on the contractor providing the services. Contractor compliance with OSHA rules and state safety regulations is

required by the contract terms and conditions.

In the past decade, BPA has awarded multiyear, master agreements and contracts for brush cutting rather than award work each season as in the past. Master agreements help strengthen BPA's relationship with contractors and enhance the understanding of the work. Recently, due to reduction in staff and increased workload, BPA has started using contract inspectors. Inspection contracts have been awarded based upon the experience and qualifications of personnel.

2.4 Accident Analysis

The Board addressed two types of issues associated with the accident: CORRUCO and Cinebar management efforts; and contractual. Prevention measures for these problems, as described below, either failed or did not exist. Successful performance with regard to any of these problems could have prevented, or mitigated, the severity of the accident.

2.4.1 Contractual/Management Issues

2.4.1.1 CORRUCO Contractual/Management Issues

This section summarizes the safety rules, as stated below, in the complete text of CORRUCO Contract 97AM57419, Clause 15-2, Safety and Health (Mar. 95)(BPI 15.2). The Contractor's safety responsibilities are as follows:

1. The Contractor shall assure that no person employed on this contract works in surroundings or under conditions that are unsanitary, hazardous, or dangerous to their health and safety. In fulfilling these responsibilities, the Contractor shall comply with:
 - (a) *Department of Labor Safety and Health Standards for Construction under Section 107 of the Contract Work Hours and Safety Standards Act (40USC327 et seq.)*.
 - (b) *Occupations Safety and Health Act of 1970 (Public Law 91-598)* and applicable rules and regulations as may have been delegated to the States.
 - (c) Supplemental Bonneville Power Administration (BPA) safety and health requirements stated below or elsewhere in the contract.
2. If there are conflicts between any of the requirements referenced in this contract, the more stringent requirements will prevail.
3. If the Contractor fails or refuses to promptly comply with any safety and health requirement, the Construction Site Representative (CSR) may notify the Contractor of any noncompliance and the Contractor shall take immediate corrective action. Such notice, whether oral or written, when served on the Contractor or any of its employees at the site of work, shall be deemed sufficient. If the Contractor fails or refuses to promptly correct the condition, the CSR may stop all or any portion of the work. Failure of the CSR to provide notice of noncompliance or to stop work shall not relieve the Contractor of its responsibilities for the safe performance of the work.

Clause 15-4, Safety, Health, and Property Protection - Services (Oct. 93)(BPI 15.2) further reinforces the Contractor's safety responsibilities as follows:

1. The Contractor shall protect the safety and health of its employees while working on a BPA site. In fulfilling these requirements, the Contractor shall comply with applicable laws, regulations, and any BPA safety and health requirements stated elsewhere in the contract. The Contractor shall immediately report to the Contracting Officer's Technical Representative (COTR) any on site injuries or property damage.
2. The Contractor shall immediately correct any noncompliance upon discovery, or upon notification by

the Contracting Officer or a designated representative. The Contracting Officer or a designated representative may issue a stop work order if the Contractor fails to promptly correct their noncompliance.

In addition, the Statement of Work (SOW) for Contract 97AM57419, Vegetation Control - Hand Cutting and Herbicide Treatment, Transmission Line Rights-of-Way, Access Roads and Structure Sites (Olympia Regions), Part A.6 E. Personal Safety requires the following contractor compliance:

1. Provide BPA Certified Safety Watcher, if determined necessary by the COTR or Field Inspector, for the protection of workmen and facilities (both Government and private).
2. Take all necessary precautions to protect persons and property against injury and damage, and be responsible for any such injury or damage that occurs as a result of fault or negligence.

2.4.1.2 Cinebar Contractual/Management Issues

This section summarizes the safety rules, as stated below, in the complete text of Cinebar Contract 97AP57473, Clause 15-4, Safety, Health, and Property Protection (Oct. 93)(BPI 15.2). The Contractor's safety responsibilities are as follows:

1. The Contractor shall protect the safety and health of its employees while working on a BPA site. In fulfilling these requirements, the Contractor shall comply with applicable laws, regulations, and any BPA safety and health requirements stated elsewhere in the contract. The Contractor shall immediately report to the Contracting Officer's Technical Representative (COTR) any on site injuries or property damage.
2. The Contractor shall immediately correct any noncompliance upon discovery, or upon notification by the Contracting Officer or a designated representative. The Contracting Officer or a designated representative may issue a stop work order if the Contractor fails to promptly correct their noncompliance.

In addition, the Statement of Work (SOW) for Contract Inspection for Vegetation Management, General Provisions calls for the following:

1. The Contractor shall be familiar with BPA standards for this type of work including all applicable OSHA and state requirements.
2. The Contractor to notify the vegetation control contractor of any apparent working conditions or practices hazardous to health or safety as determined under applicable BPA and Federal OSHA requirements. If there is imminent danger to life or property, Contractor will request a work stoppage until the situation is corrected.
3. The Contractor must recognize and document workmanship and methods which might endanger life, property, or Government facilities.

A "tailgate" instructional meeting, attended by all CORRUCO employees and the inspector, was conducted on the morning of June 25, 1997, before the accident and prior to work commencing (See Exhibit 3). The inspector was not able to confirm, or did not ensure, that workers fully understood their work assignments, safety requirements, and acceptable work practices; nor did the inspector verify that safe work processes were being implemented at the job site. Safety measures failed because the inspector was not aware of, or ignored, tree-falling work methods being used.

2.4.2 BPA Contractual Issues

BPA's contractual oversight regarding the enforcement of contract safety requirements is adequate within present operating policies and contractual language. BPA made efforts, relative to contract language, to ensure that the contractor(s) fully understood their responsibilities or had methods in place to obtain required safety compliance and qualified employees. BPA's "hands-off" approach to contractor safety is consistent with other Federal agencies and electrical utilities in general. Contract terms and conditions

place the responsibility and liability for safety solely with the Contractor(s).

It is the Board's opinion that BPA could not have prevented this accident. Where hazardous work practices may exist, procedures and methods used by contractors may need more emphasis, along with continued training of BPA COTRs and Inspectors to assure that they have working knowledge of appropriate OSHA regulations on tree falling and can recognize possible hazards within work locations.

2.5 CAUSAL FACTORS

The Root Causes of the accident (the fundamental causes that, if eliminated or modified, could prevent a recurrence of this, or similar, accidents) are as follows:

1. Failure of CORRUCO to properly train workers associated with brush/tree cutting, especially tree-falling requirements.
2. Failure of CORRUCO to assure that only properly trained and experienced employees were allowed to fell large trees.
3. Failure of the work site supervisor/faller to assure that the area where the cottonwood tree was to be felled was clear of all personnel.
4. Failure of safety measures: the inspector was not aware of, or ignored, proper tree-falling methods.

Contributing Causes of the accident are as follows:

1. CORRUCO management had responsibility and was accountable for worker safety. However, there is no evidence of workers and/or supervisors being properly trained to perform assigned tasks in a safe manner.
2. CORRUCO's work planning, organizing and execution were inadequate, as were provisions for adequate safe work procedures, ability to follow a safe work plan, and assurance that existing safe work procedures were implemented or adhered to.
3. CORRUCO and Cinebar failed to adequately ensure effective communication between the inspector and the foreman, who were speaking and understanding different languages (English & Spanish).
4. CORRUCO failed to adequately communicate work assignments to all members of the crew. The inspector told the foreman what work to accomplish and the foreman instructed CORRUCO employees on their work assignments.

The combination of these causal factors was the primary reason the contract inspector was susceptible to being hit by a tree at the time of the tree-falling work process. These causes, if eliminated or changed, could have prevented this accident and might prevent future occurrences. All causes should be taken to the owners (responsible for management procedures) of both CORRUCO and Cinebar Services for review and implementation within their organization policies and requirements. The Board believes that presenting the causes and lessons learned at all levels of management and labor will be helpful to those in field work locations.

3.0 CONCLUSIONS AND JUDGMENTS OF NEED

Conclusions are a synopsis of those known facts and analytical results that the Board considers especially significant. Judgments of needs are managerial controls and safety measures believed necessary to prevent or mitigate the probability or severity of a recurrence. They flow from the conclusions and causal factors and are directed at guiding managers in the development of follow-up actions.

CONCLUSIONS	JUDGEMENT OF NEEDS
CORRUCO	
<ul style="list-style-type: none"> • The foreman was working in five different capacities. • The crew was under the supervision of a foreman in working status at the time of the accident. • The foreman was the only English-speaking person on the brush/tree-cutting crew and, therefore, the only person capable of trying to call for emergency help. But his command of English was insufficient to actually allow him to call for help. • No emergency First Aid was administered. • The foreman was also the only CPR/First Aid-certified card holder. 	<ul style="list-style-type: none"> • Provisions made so that the foreman is not too preoccupied with his own working status to adequately supervise the crew. • A person present who clearly understands English, assuring clear communication of the work and hazards involved, capable of calling for emergency help. • A certified First Aid/CPR person to be on site at all times. • A verification process to confirm the required certifications and/or training.
<ul style="list-style-type: none"> • Work planning, organizing and execution were inadequate, as were provisions for adequate safe work procedures, ability to follow a safe work plan and assurance that existing safe work procedures were implemented or adhered to. • Inadequately communicated work assignments to all members of the crew. The inspector told the foreman what work to accomplish and the foreman instructed CORRUCO employees on their work assignments. • Crew members had no knowledge of the site in relation to the surrounding area (cross roads, etc.). • There was no evidence at the accident site for an organized escape plan or safe escape routes while cutting the brush/trees from the right-of-way. 	<ul style="list-style-type: none"> • Hold a tailgate/job briefing at the beginning of each work day and at any time the job has a significant change of work or direction. • Cover all aspects of the job and ensure all personnel clearly understand their duties and the task objectives, equipment and personal protective equipment involved, and all associated hazards. • Specifically address safety conditions and requirements.
<ul style="list-style-type: none"> • The crew was not adequately trained to recognize the hazards involved in tree-falling operations. • Due to lack of training and poor tree-cutting techniques, each of the larger (>30') trees fallen represented a potentially fatal threat. • No training records of worker qualification for tree falling were available. • Only properly trained and experienced employees should be permitted to cut larger (>30') trees. 	<ul style="list-style-type: none"> • Clearly outline and verify the qualifications and training required to safely accomplish the tasks. • Distinguish the different qualifications required for brush cutting and tree fallers. • Employ an adequate ratio of qualified tree fallers to brush cutters, a safer and more efficient process than splitting up the tasks into two separate contracts.
<ul style="list-style-type: none"> • Warning signals, required to be in accordance with federal and state requirements during the falling of trees, were inadequate. • Crew members did not always maintain visual contact with one another during the falling process. 	<ul style="list-style-type: none"> • Verify contractor knowledge, experience, abilities and training records to ensure that the contractor can perform work consistent with all Federal and state regulations governing the tasks outlined in the contract.

- Communication between crew members was limited while in the falling area due to heavy vegetation and rough terrain.
- The required Federal and State minimal distance of workers from trees being fallen was not maintained.

Cinebar Services

- The inspector did not enforce State/Federal regulations for tree-cutting procedures as required by the Cinebar contract.
- Cinebar failed to adequately ensure effective communication between the inspector and the foreman, who were speaking and understanding two different languages (English & Spanish).
- The inspector failed to adequately communicate to the crew the relative location of the work site for emergency/accident purposes.

- Enforce and follow all Federal and state regulations governing the type of work outlined in the contract.
- Identified and address communication barriers.
- Require and verify documentation of inspector training and qualifications.

- The inspector, walking through the tree-cutting area, failed to maintain the required minimum distance between himself and the tree being fallen.
- The inspector failed to communicate and coordinate his location with the tree faller.

- The contract should explicitly state that the person in charge of overseeing tasks must communicate and verify all actions and aspects of the job to be accomplished.
- Coordinate with the brush-cutting crew supervisor at all times.

BPA

- Did not insure proper qualification of contractors (i.e., training records, employee qualifications, safety records, historical contractor safety performance, etc.).
- Contract requires contractors to follow safety rules of BPA, OSHA, and WISHA, but BPA did not provide copies, enforcement or oversight of the contract.
- Contracts did not require or ensure that people with adequate language skills (i.e., ability to speak English or Spanish) be present on site.
- Construction and tree/brush-cutting safety contractual language needs consistency.
- Contractual language allows the on-site inspector to approve unqualified fallers to cut trees. Contract language does not adequately differentiate between “trees” and “brush” or differing qualifications thereof.

- Hold a prework meeting prior to giving the service contractor notice to proceed to verify the qualifications and training records required by the service contract.
- Thorough evaluation of past contractor safety performance in the contractor selection process. This would include reviewing applicable Federal and/or state regulatory agency documents, which can be located on the OSHA Internet home page.
- Address adequate language skills to ensure clarity of communication as well as the overall safety of all personnel.
- Differing aspects of contractual safety language between construction and tree/brush cutting need to be identified and applied to future contractual arrangements.
- The service contract should clearly define the qualifications required to accomplish the service contract safely and efficiently. It should ensure the presence of qualified tree fallers as well as brush cutters.

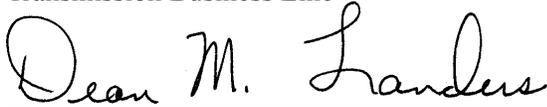
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BOARD SIGNATURES



Date: September 11, 1997

Truman W. Conn
Accident Investigation Board Chairperson
BPA Walla Walla Regional Manager,
Transmission Business Line



Date: September 11, 1997

Dean M. Landers
Accident Investigation Board Member
BPA Manager for Internal Activities and Special Issues,
Transmission Business Line



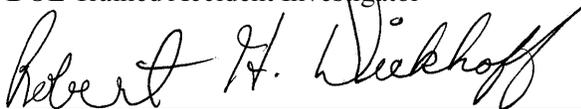
Date: September 11, 1997

Robb R. Pierson
Accident Investigation Board Member
BPA Procurement Analyst
Transmission Business Line



Date: September 11, 1997

Eugene McClellan
Accident Investigation Board Member
BPA Safety & Occupational Health Manager,
Business Services
Lead Accident Investigator
DOE Trained Accident Investigator



Date: September 11, 1997

Robert Dickhoff
Accident Investigation Board Member
BPA Safety & Occupational Health Manager,
Business Services
DOE Trained Accident Investigator



Date: September 11, 1997

Barry J. Clark
Accident Investigation Board Member
WAPA Safety Specialist
Sierra, Nevada Customer Service Region

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BOARD MEMBERS, ADVISORS, AND STAFF

Chairperson	Truman W. Conn, BPA, TFP/Walla Walla
Member	Dean M. Landers, BPA, TF/DOB1
Member	Robb R. Pierson, BPA, TSP/CSB
Member	Eugene McClellan, BPA, CC/Z992
Member	Robert Dickhoff, BPA, CC/Walla Walla
Member	Barry J. Clark, WAPA, Sierra Nevada Region
Technical Advisor	Jay B. Dick, BPA, CC/Z992
Legal Advisor	Robert L. Jones, BPA, LL-7
Medical Advisor	Thomas P. Anderson, M.D.
Technical Writer	Stuart Sandler, Contractor

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APPENDIX A
APPOINTMENT MEMO FOR TYPE A ACCIDENT INVESTIGATION

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United States Government

Department of Energy
Bonneville Power Administration

memorandum

DATE: JUN 27 1997

REPLY TO
ATTN OF: CC/Z992

SUBJECT: Accident Review Board, Contractor Fatality of June 25, 1997

TO: James H. Curtis, Senior VP for Business Services - C

This memorandum is to confirm the appointment of the individuals listed below to the Bonneville Power Administration's Accident Review Board. The purpose of the Board is to investigate the fatal contractor accident that occurred on June 25, 1997.

Truman W. Conn	BPA Walla Walla Region Manager, Transmission Business Line, Chairperson
Dean Landers	BPA Manager for Internal Activities and Special Issues, Transmission Business Line, Board Member
Robin Pierson	BPA Procurement Analyst, Transmission Business Line, Board Member
Eugene McClellan	BPA Occupational Safety and Health Manager, Business Services, Lead Investigator and DOE Trained Accident Investigator, Board Member
Robert Dickhoff	BPA Occupational Safety and Health Manager, Business Services, DOE Trained Accident Investigator, Board Member
Barry Clark	Western Area Power Administration Safety Specialist, Sierra, Nevada Region, Board Member

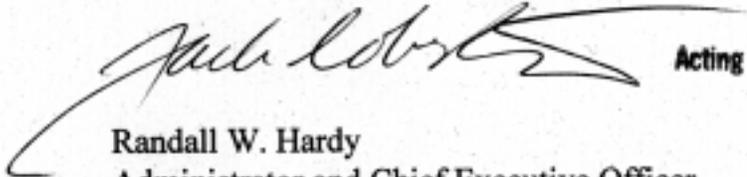
The following individuals will provide technical support to the board:

Jay Dick	BPA Occupational Safety and Health Manager, Business Services
Robert Jones	BPA Attorney, Office of General Counsel

The accident shall be thoroughly investigated and a report prepared in a manner consistent with DOE Order 225.1 and BPA Manual Chapter 181. During the investigation, the team shall review the accident site, equipment, work procedures, management systems, and other elements that are possible factors in the accident. Working with the Washington State Department of Labor investigation team is important to assure a complete, thorough, and competent assembly of facts. Do not hesitate to seek the technical assistance of any others that may help in your

analysis of the findings. Bonneville's final report shall include the facts, analysis of facts, probable cause (conclusions), and judgment of needs.

The report shall be forwarded by memorandum which states the Board's recommendations to me within 30 calendar days. The Board should keep this Office advised of the continuing investigative process.



Acting

Randall W. Hardy
Administrator and Chief Executive Officer

cc:

Adm. Chron. File - A
S. Hickey - A-7
J. Curtis - C-2
R. Dickhoff - CC/Walla Walla
J. Dick - CC/Z992
G. McClellan - CC/Z992
R. Jones - LL-7
H. Spigal - T-DOB1-N
F. Johnson - TF-DOB1
D. Landers - TF-DOB1
O. Albro - TFO-Olympia
T. Conn - TFP-Walla Walla
R. Pierson - TS-CSB
M. Nelson - TS-PSB-2
Official File - CC (PE-53-12)

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APPENDIX B
DEFINITIONS, ACRONYMS & INITIALS

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APPENDIX B - DEFINITIONS, ACRONYMS & INITIALISMS

ahead-on-line (AHOL): The direction of increasing tower numbers or miles on a power line. Normally numbered from source to load.

back cut (felling cut): The cut in a falling operation of a tree, made on the opposite side from the under-cut. The final cut in a falling operation.

back-on-line (BOL): The direction of decreasing tower numbers or miles on a power line.

brush: A thicket of shrubs or bushes. Cut or broken branches.

butt: The bottom of that fallen part of a tree.

Contracting Officer (CO): The person responsible for ensuring performance of all actions required for effective contracting, compliance with terms of the contract, and safeguarding the interests of BPA in its contractual relationships.

Contracting Officer's Technical Representative (COTR): The person responsible for monitoring whether BPA has received, in a timely manner, the goods and services that conform to technical requirements set forth in the contract.

corridor: A strip of land forming a passageway for utility facilities.

danger brush: Any plant growing in the transmission line right-of-way that could contact any conductors if it falls, or presents an immediate hazard of potential encroachment within the safe distance to the conductor from bending, growing, swinging, or falling toward the conductors.

danger tree: Any tree growing adjacent to a transmission line right-of-way that could contact any of the conductors if it falls, or presents an immediate hazard of potential encroachment within the safe distance to the conductor from bending, growing, swinging, or falling toward the conductors.

escape route: A predetermined path of exit used by fallers when falling or bucking. The essential components of an escape route are the selection of the desired direction and distance, prior to falling or bucking, and a well-cleared path.

face cut: A section of wood sawed and removed from a tree's base. Its removal allows the tree to fall and assists in directing where it will fall. The face is comprised of two separate cuts that have constant relationships: the horizontal cut must be at least 1/3 the diameter of the tree; the sloping cut must be angled enough to allow a wide opening, and the two cuts must not cross each other.

fall (fell): To cut down trees.

faller (feller): An employee who falls trees. Specialist who falls and bucks trees in a safe manner while utilizing as much of the tree as possible.

hazardous falling area: The area within a circle centered on a tree being fallen and having a radius not less than twice the height of that tree.

inspector: Authorized representative of the COTR, who is responsible for on-site inspection and review of work performed under the contract.

OSHA: Occupational Safety and Health Administration (Federal).

qualified person: A person who, by possession of a recognized degree, certificate, professional standing, or by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, work, or project.

right-of-way (ROW): An easement for a certain purpose over the land of another, such as the strip of land used for a road, electric transmission line, ditch, pipeline, etc.

selective cut: A single cut in a tree where no undercut or face cut is utilized.

transmission: In power-system usage, the bulk transport of electricity from large generation centers over significant distances to interchanges with large industries and distribution networks of utilities.

tree: A tall, woody plant having comparatively great height and a single trunk.

undercut: A notch cut in a tree to guide the direction of the tree's fall and to prevent splitting or kickback.

WISHA: Washington Industrial Safety and Health Administration, Washington State Department of Labor and Industries.

WAC: Washington Administration Code, Washington State Department of Labor and Industries.

worked: An area where trees, brush and other vegetation have been cut and/or trimmed, but not cleared, allowing the vegetation to rot and provide habitat.